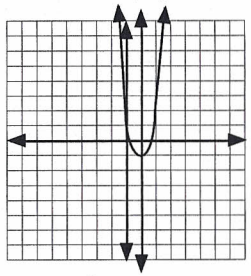
25A

You should be able to sketch the graph using the vertex and the original equation. If you wish you may chart a few points for a more accurate graph. Estimate the graph first so that you can chose the most useful values of X to try.



1) $Y = 3X^2 - 6X + 2$

$X = \frac{-B}{2A} = \frac{-(-6)}{2(3)}$

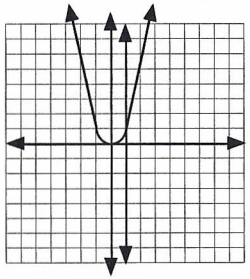
$X = 1$

$Y = 3(1)^2 - 6(1) + 2$

$Y = -1$

vertex = (1, -1)

X	Y
2	2
3	11



2) $4Y = 4X^2 + 8X + 4$

$Y = X^2 + 2X + 1$

$X = \frac{-B}{2A} = \frac{-(2)}{2(1)}$

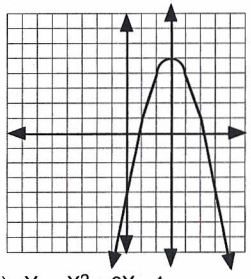
$X = -1$

$Y = (-1)^2 + 2(-1) + 1$

$Y = 0$

vertex = (-1, 0)

X	Y
-2	1
-4	9



3) $Y = -X^2 + 6X - 4$

$X = \frac{-B}{2A} = \frac{-(6)}{2(-1)}$

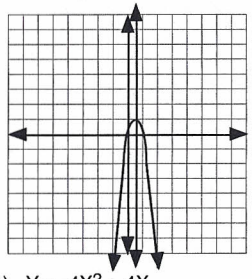
$X = 3$

$Y = -(3)^2 + 6(3) - 4$

$Y = 5$

vertex = (3, 5)

X	Y
0	-4
2	4
6	-4



4) $Y = -4X^2 + 4X$

$X = \frac{-B}{2A} = \frac{-(4)}{2(-4)}$

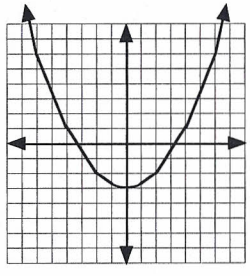
$X = 1/2$

$Y = -4(1/2)^2 + 4(1/2)$

$Y = 1$

vertex = (1/2, 1)

X	Y
1	0
2	-8



5) $Y = 1/4\ X^2 - 3$

$X = \frac{-B}{2A} = \frac{-(0)}{2(1/4)}$

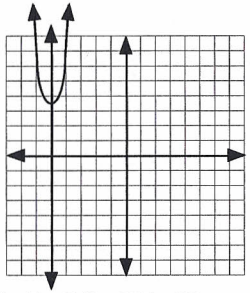
$X = 0$

$Y = 1/4\ (0)^2 - 3$

$Y = -3$

vertex = (0, -3)

X	Y
2	-2
4	1
6	6



6) $Y = 3X^2 + 30X + 78$

$X = \frac{-B}{2A} = \frac{-(30)}{2(3)}$

$X = -5$

$Y=3(-5)^2+30(-5)+78$

$Y = 3$

vertex = (-5, 3)

X	Y
-4	6
-6	6

7) (36 - 2X) ÷ 2

X [ ] X

area = X (18 - X)

$= 18X - X^2$

$= -X^2 + 18X$

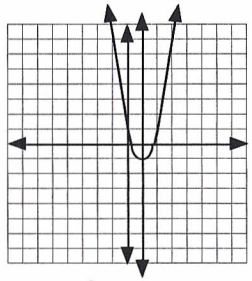
axis of symmetry $= \frac{-18}{2(-1)} = 9$

area = $-(9)^2 + 18(9) = 81$

vertex (maxima) = (9, 81)

maximum area = 9 x 9 = 81 ft.^{2}

25B



1) $Y = 2X^2 - 4X + 1$

$X = \frac{-B}{2A} = \frac{-(-4)}{2(2)}$

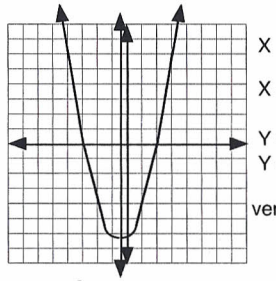
$X = 1$

$Y = 2(1)^2 - 4(1) + 1$

$Y = -1$

vertex = (1, -1)

X	Y
2	1
3	7



2) $Y = X^2 + X - 6$

$X = \frac{-B}{2A} = \frac{-(1)}{2(1)}$

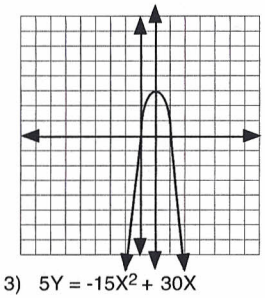
$X = -1/2$

$Y = (-1/2)^2+(-1/2)-6$

$Y = -6\ 1/4$

vertex = (-1/2, -6 1/4)

X	Y
2	0
3	6



3) $5Y = -15X^2 + 30X$

$Y = -3X^2 + 6X$

$X = \frac{-B}{2A} = \frac{-(6)}{2(-3)}$

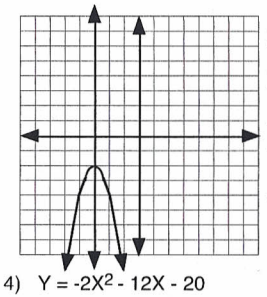
$X = 1$

$Y = -3(1)^2 + 6(1)$

$Y = 3$

vertex = (1,3)

X	Y
2	0
3	-9



4) $Y = -2X^2 - 12X - 20$

$X = \frac{-B}{2A} = \frac{-(-12)}{2(-2)}$

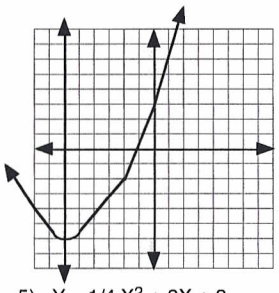
$X = -3$

$Y=-2(-3)^2-12(-3)-20$

$Y = -2$

vertex = (-3,-2)

X	Y
-2	-4
-1	-10



5) $Y = 1/4\ X^2 + 3X + 3$

$X = \frac{-B}{2A} = \frac{-(3)}{2(1/4)}$

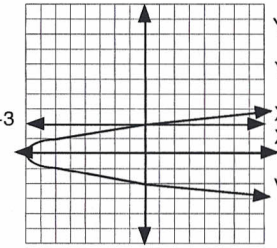
$X = -6$

$Y = 1/4(-6)^2+3(-6)+3$

$Y = -6$

vertex = (-6, -6)

X	Y
-2	-2
0	3
1	6 1/4



6) $X = 2Y^2 + 8Y$

$Y = \frac{-B}{2A} = \frac{-(8)}{2(2)}$

$Y = -2$

$X =2(-2)^2+8(-2)=-8$

$X = -8$

vertex = (-8, -2)

X	Y
-6	-3
-6	-1
0	0

7) 260 - 2X

X [ ] X

area = X (260 - 2X)

$= 260X - 2X^2$

$= -2X^2 + 260X$

axis of symmetry $= \frac{-260}{2(-2)} = 65$

area = $-2(65)^2 + 260(65) = 8{,}450$

vertex (maxima) = (65, 8450)

maximum area = 65 x 130 = 8,450 ft.^{2}

25C

1) $[6Y = 3X^2 + 24X] \div 6 \Rightarrow Y = 1/2\ X^2 + 4X$

$\frac{-B}{2A} = \frac{-4}{2(1/2)} = -4$

2) $Y = 1/2(-4)^2 + 4(-4) = 8 - 16 = -8$

3) on the graph

4) $\frac{-(-4)}{2(-2)} = \frac{4}{-4} = -1$

5) $Y = -2(-1)^2 - 4(-1) - 3 = -1$

6) on the graph

7) points up

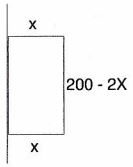
8) Y axis

9-10) $Area = X(200 - 2X) = 200X - 2X^2$

$= -2X^2 + 200X$

$\frac{-B}{2A} = \frac{-200}{2(-2)} = 50$

house



$A = 200(50) - 2(50) - 2(50)^2 = 5{,}000$

Dimensions: 50' by 100'

11) on the graph

12) $2Y = X^2 - 2 \Rightarrow Y = 1/2\ X^2 - 1$ (on the graph)

13) $[2(X - 3)^2 + 2(Y + 2)^2 = 72] \div 2$

$(X - 3)^2 + (Y + 2)^2 = 6^2$

C = (3, -2) R = 6

14) $(X - 1)^2 + (Y - 4)^2 = 5^2$ or 25

15-16) $X^2 - 4X + 4 + Y^2 = 5 + 4$

$(X - 2)^2 + (Y)^2 = 3^2$

C = (2, 0) R = 3

17) $AB^2 = (-4 - 3)^2 + (-1 - 5)^2 = 49 + 36 = 85$

$AB = \sqrt{85}$

18) $\left(\frac{3 + 3}{2}\right), \left(\frac{5 - 2}{2}\right) = \left(3, 1\frac{1}{2}\right)$

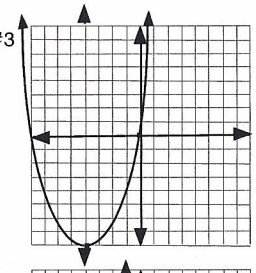
19) C = (-2, -3)

Y = ± 3 from center of ellipse

X = ± 4

20) on the graph

#3



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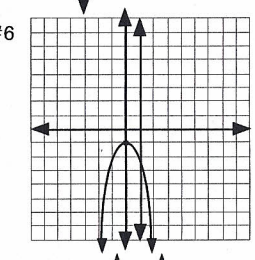

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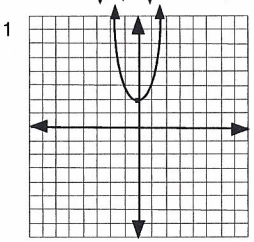

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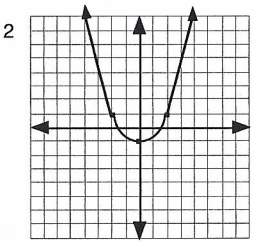

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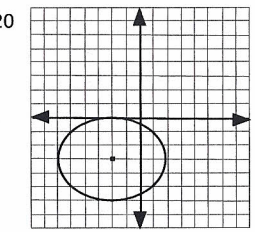


25D

1) $\frac{-B}{2A} = \frac{-(-4)}{2(1)} = 2$

2) $Y = (2)^2 - 4(2) + 3 = 4 - 8 + 3 = -1$

3) on the graph

4) $[2Y + X^2 = 8X - 4] \div 2 \Rightarrow Y = -1/2\ X^2 + 4X - 2$

$\frac{-4}{2(-1/2)} = 4$

5) $Y = -1/2(4)^2 + 4(4) - 2 = 6$

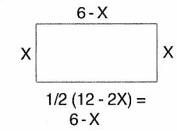
6) on the graph

7) steeper

8) left and right

9-10) $Area = X(6 - X) = 6X - X^2$

$\frac{-B}{2A} = \frac{-6}{2(-1)} = 3$



$A = 3(6 - 3) = 9$

Dimensions: 3' x 3'

11) $[3Y + 6X^2 = 6] \div 3 \Rightarrow Y = -2X^2 + 2$ (on the graph)

12) $Y = -X^2$ (on the graph)

13) $[3(X + 1)^2 + 3(Y + 4)^2 = 147] \div 3 \Rightarrow$

$(X + 1)^2 + (Y + 4)^2 = 7^2 = 49$

C = (-1, -4) R = 7

14) $(X - 0)^2 + (Y + 3)^2 = 6^2$

$X^2 + (Y + 3)^2 = 36$

15-16) $X^2 + 4X + 4 + Y^2 + 6Y + 9 = 3 + 13$

$(X + 2)^2 + (Y + 3)^2 = 4^2$

C = (-2, -3) R = 4

17) $AB^2 = [3 - (-2)]^2 + [-2 + 2]^2 = 25 + 0 = \sqrt{25}$

AB = 5

18) $\left(\frac{-2 + 3}{2}\right), \left(\frac{-2 + 2}{2}\right) = \left(\frac{1}{2}, 0\right)$

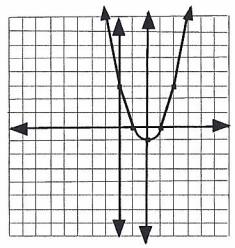
19) $[-3Y \le -2X + 3] \div (-3) \Rightarrow Y \ge 2/3\ X - 1$

20) on the graph

$(0) \ge 2/3(0) - 1$ $(0) \ge 2/3(3) - 1$

$0 \ge -1$ yes $0 \ge 1$ no

#3



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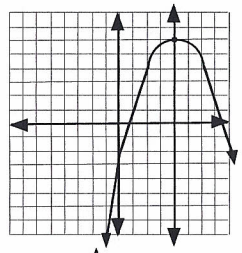

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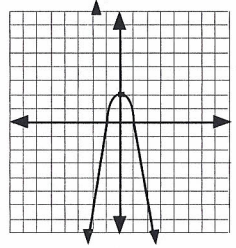

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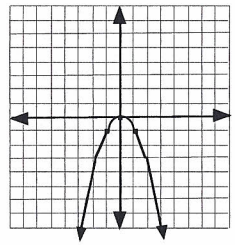

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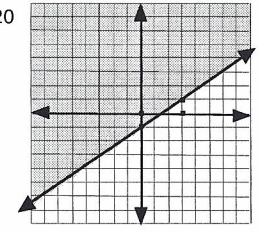


25E

1) $Y = -2X^2 + 3X - 5$

$$\frac{-B}{2A} = \frac{-3}{2(-2)} = \frac{3}{4}$$

2) $Y = -2(3/4)^2 + 3(3/4) - 5 = -3\ 7/8$

3) on the graph

4) $Y = 3X^2 - 2X - 1$

$$\frac{-(-2)}{3} = \frac{1}{3}$$

5) $Y = 3(1/3)^2 - 2(1/3) - 1 = -4/3$

6) on the graph

7) points down

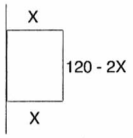
8) $\frac{-B}{2A}$

9-10) Area $= X(120 - 2X) = 120X - 2X^2$

$$\frac{-B}{2A} = \frac{-120}{2(-2)} = 30$$

$A = 120(30) - 2(30)^2 = 1{,}800$

Dimensions: 30' by 60'



11) $Y = -2/4\ X^2 - 2 \Rightarrow Y = -1/2\ X^2 - 2$ (on the graph)

12) $-Y = -3X^2 - 1 \Rightarrow Y = 3X^2 + 1$ (on the graph)

13) C = (2, 3) R = 6

14) $(X + 1)^2 + (Y + 1)^2 = 7^2$ or 49

15-16) $(X - 0)^2 + (Y^2 - 6X + 9) = -5 + 9$

$(X - 0)^2 + (Y - 3)^2 = 2^2$

C = (0, 3) R = 2

17) $AC^2 = [-6 - 2]^2 + [-4 - (-6)]^2 = 64 + 4 = 68$

$AC = \sqrt{68} = 2\sqrt{17}$

18) $\left(\frac{-2+2}{2}\right), \left(\frac{-4-6}{2}\right) = (0, -5)$

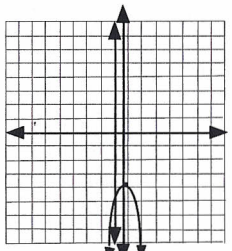
19) C = (1 -2)

Y = ± 5 from center of ellipse

$X = \pm 2\sqrt{5} \approx \pm 4.5$

20) on the graph

#3



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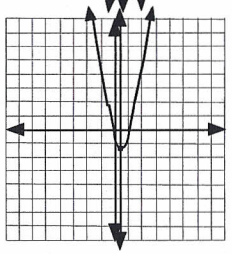

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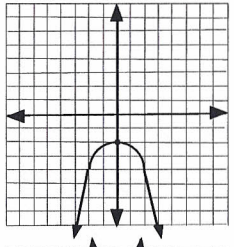

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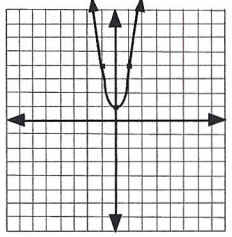

#20